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14. ABSTRACT

This retrospective study examines 1,529 data observations based on eligible beneficiaries who received outpatient care (primary and specialty) within the catchment areas of three military treatment facilities located at Nellis AFB, Langley AFB and Travis AFB during fiscal year 2006. Data was collected from the Military Health System Management Analysis and Reporting Tool (M2). Univariate analysis of variance was used to determine the difference between workload, measured in relative value units (RVUs) per military beneficiary, and the demographic variables of age, gender and beneficiary category. The results of the main interaction effects between the dependent variable (RVUs/beneficiary) and age category yielded $F(6, 1480) = 11.17$, $p < .000$. Likewise, significant results were found for gender $F(1, 1480) = 30.65$, $p < .000$ and beneficiary category $F(3, 1480)$. These findings contribute to the future development of a predictive model for determining the workload produced at Air Force Medical Service (AFMS) military treatment facilities.

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Army-Baylor Graduate Program in Health and Business Administration

Graduate Management Project

Outpatient Workload (RVU) Predictors: Age, Gender & Beneficiary Category

In Partial Fulfillment of the Requirements for the MHA/MBA Degree in Health and

Business Administration

By

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Abstract

This retrospective study examines 1,529 data observations based on eligible beneficiaries who received outpatient care (primary and specialty) within the catchment areas of three military treatment facilities located at Nellis AFB, Langley AFB and Travis AFB during fiscal year 2006. The data was collected from the Military Health System Management Analysis and Reporting Tool (M2). The research utilizes univariate analysis of variance to determine the difference between workload, measured in relative value units (RVUs) per military beneficiary, and the demographic variables of age, gender and beneficiary category. The study's main purpose is to explain the difference between workload (RVUs/beneficiary) and the independent variables for future use in the development of a predictive model for determining the workload produced at Air Force Medical Service (AFMS) military treatment facilities. The results of the main interaction effects between the dependent variable (RVUs/beneficiary) and age category yielded $F(6, 1480) = 11.17$, $p < .000$. Likewise, significant results were found for gender $F(1, 1480) = 30.65$, $p < .000$ and beneficiary category $F(3, 1480) = 51.85$, $p < .000$. Significant results are also recognized for the interaction effects between age category and gender $F(6,1480) = 8.61$, $p < .000$, age category and beneficiary category $F(15, 1480) = 6.05$, $p < .000$ and gender and beneficiary category $F(3, 1480) = 6.19$, $p < .000$. These findings contribute to the development of a more accurate forecasting model for use in AFMS military treatment facilities, resulting in more effective and efficient utilization of resources used for the delivery of patient care.

Disclosure

All information that might have been used to identify individual patients was removed prior to the acquisition of data from the transplant clinic in question. Ethical issues with this research effort were considered. Due to the nature and format of the data as described in the following section, the researcher did not find any significant ethical concerns. The author has no financial interest in the outcome of the analysis.

The views expressed in this presentation are those of the researcher and do not reflect official policy of the Departments of the Army, Air Force, Navy, Department of Defense, Baylor University, or the U.S. Government.

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To my beloved wife, Christine and my 7 week old son, Jacob; my eternal gratitude for your sacrifice, understanding, love and support over the past two years in my mission to successfully complete the Army-Baylor MHA/MBA Program in Health and Business Administration.

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Introduction

Rapidly rising healthcare costs are apparent in the private sector as well as the military healthcare system (MHS). These costs have placed a spotlight on the efficiency and effectiveness used to provide medical care. The private sector has turned to managed care and cost sharing to control costs. On the other hand, the MHS is leveraging base realignment and closing (BRAC) guidance with the latest trends in healthcare deliver and management in their attempt to curtail rising costs.

Private Sector Costs

In 2005, total national healthcare expenditures increased 6.9% to approximately $2.0 trillion (Catlin, Cowan, Heffler & Washington, 2006). This rate of growth is equal to $6,697 per person, a rise of 27% from the 2002 per person rate of $5,267 (Bodenheimer, 2005a; Catlin et al., 2006). U.S. healthcare expenditures are expected to increase at similar levels over the next decade reaching $4 trillion by 2015, or 20% of gross domestic product (GDP) (Borger et al., 2006). Additional 2005 statistics state that healthcare costs represented 16.0% of GDP, up slightly from the 15.9% reported in 2004. Bodenheimer's (2005a) research stated that the federal government is projecting a growth rate of 7.2% per year for healthcare expenditures through the year 2013, with overall healthcare spending expected to exceed 18.4% of the nation's gross domestic product by 2013. Moreover, from an employer's perspective, 2006 figures reveal a 7.7% increase in health insurance premiums (The Henry J. Kaiser, 2006). This figure reflects a rate two times that of inflation. In dollars, the annual premium for an employer health plan covering a family of four averaged $11,500, while the average coverage for a single person averaged $4,300 (The Henry J. Kaiser, 2006). Rising costs are a major consideration in evaluating the efficiency and effectiveness of both the civilian and

military healthcare systems.

Military Health System Costs

Similar to the private sector, the military healthcare system (MHS), in which the Air Force Medical Service (AFMS) resides, has realized an exponential rise in the cost of providing healthcare since 2001 ($19B to $38B in Fiscal Year 2006) (Future of Military Health Care, 2007). Since World War II, the U.S. has grown to represent the world's largest military healthcare system. In 2007, the MHS provided care to 9.1M beneficiaries, including active duty and families of active duty military personnel, military retirees and their dependents, as well as reservists. Over the past decade, the military has continued to give priority to military readiness while facing the challenges of an aging military retiree population, rising costs of technology and pharmaceuticals, and greater use of services (Bodenheimer, 2005b; Bodenheimer, 2005c; Future of Military Healthcare, 2007). These factors have led to a doubling of the cost of the military medical delivery system from $19B in FY01 to $39.4B in FY07. Spending on pharmacy services (pharmaceuticals) alone has quadrupled from $1.6B in 2000 to $6.5B in 2007. At the current rate, cost projections anticipate the MHS reaching $64B in healthcare expenditures by 2015, increasing the medical health portion of the Department of Defense (DoD) budget from 8 to 12 percent (Future of Military Healthcare, 2007). Conversely, private sector Healthcare Maintenance Organizations (HMOs) have increased the amount of cost sharing with employers, reduced coverage, increased co-payments and improved the bottom line through gate keeping. The MHS has not been as aggressive in passing rising costs onto its beneficiaries. In fact, the proportion of costs the military beneficiary bears has decreased from 27% to 12% over the past 10 years (Future of Military Healthcare, 2007).

Rising healthcare costs have created many challenges for organizations delivering healthcare. These challenges have provided healthcare administrators unique opportunities to implement initiatives designed to meet beneficiaries' medical needs. One trend in the delivery of healthcare is the transition from inpatient hospital stays to same day outpatient procedures. As a measure to cut overall inpatient costs, procedures that were once performed on an inpatient basis are increasingly occurring as an outpatient procedure. This trend is made possible through the development of new medical procedures and technological advances.

The military healthcare system (MHS), and more specifically the AFMS, is experiencing a similar trend. According to the recent BRAC guidance, the AFMS will downsize to just two medical centers. The two remaining medical centers will be Travis Air Force Base (AFB) in California and Wright Patterson AFB in Ohio. The AFMS hospital footprint will also be reduced to eleven hospitals, with only six hospitals remaining in the United States. The remaining inpatient hospitals will close and consolidate in an effort to improve efficiency and realize a cost savings associated with the transition to outpatient services.

Moreover, there are additional corporate costs in the AFMS that are not commonly acknowledged. One such cost is that of readiness and its associated requirements that are unique to the military. Readiness requirements place additional burdens on the cost of providing healthcare within the AFMS that the private marketplace does not have to address. A few of these medical readiness costs consist of the Armed Forces policy that requires service members to have health assessments conducted before and after deployment. Such assessments ensure health readiness

before deployment and are used to identify and capture any health issues upon the service member's return. The health assessment process also includes a quality assurance program to monitor the conduct of the assessments. In addition to a pre-deployment health assessment, deploying military personnel are provided required medical equipment, serum samples and relevant geographical health related briefings. Besides health assessments, immunizations are provided to offer protection from endemic disease, as well as from agents that could be used as biological weapons, including anthrax and smallpox. The military also utilizes resources for education and training for combat casualty care and aeromedical evacuation from the theatre of operations.

As the focus on outpatient services (primary and specialty care) continues, it is imperative that the AFMS accurately match healthcare resources with the demand for its medical services. The rising cost of providing medical care within the MHS combined with the increasing trend in outpatient workload and the modification of Air Force hospitals into robust outpatient centers provide the impetus for this study.

Conditions that Prompted the Study

Over the past decade the MHS resourcing model has seen the use of baseline budgeting, zero-based budgeting and capitation models to fund its military treatment facilities. In 2005, the MHS introduced a Prospective Payment System (PPS) to fund medical facilities as a way to control the growth rate of peacetime healthcare costs. The Center for Medicare and Medicaid Services (CMS) introduced the PPS in 1983 and expanded this practice to its outpatient services in 1997. PPS resourcing is based on outputs, otherwise known as productivity, as opposed to the historical use of inputs

(costs).

<div align="center">Prospective Payment System and RVUs</div>

Under the AFMS Prospective Payment System each military treatment facility

(MTF) receives funds to provide medical care based on the submission of an annual

business plan (BP). Currently, an MTF's funding request (BP) is an annual forecast

based on the "supply" of medical resources. Throughout the remainder of the research,

the word "supply" is used to refer to the number of full time equivalents (FTEs) or level

of staffing in each product line relative to its outlined capacity. These supply or

FTEs/staffing figures are used to determine the volume of workload that can be

produced during the upcoming fiscal year. An MTFs aggregate average relative value

unit (RVU) rate that is based on prior year's workload is applied to the forecasted

volume of care for the upcoming fiscal year. These values are used to calculate the

cost of providing medical care and are a portion of the funds requested through the

annual business plan to provide medical care for eligible beneficiaries. Additional

dollars are also added to the MTFs annual forecast and subsequent request for funds to

account for medical care that is sent to the private sector. Medical care that is referred

to the private sector is a result of demand for medical services by enrolled beneficiaries

for a product line within the MTF that cannot be met or for medical care that the MTF

cannot provide.

MTFs are funded for the medical services they provide through relative weighted

products (RWPs), relative value units (RVUs), hospital bed days and a forecasted value

for purchased care requirements. Inpatient care uses the weighted workload of

inpatient discharges measured in RWPs. RWPs are weighted for intensity of care

based on diagnostic related groups (DRGs). The outpatient care side includes both

primary and specialty care. MTFs are funded for outpatient care (primary and specialty care) based on RVU production. As previously discussed, the trend in providing medical care is a shift from inpatient to outpatient services. Therefore, the focus of this research study will be the RVU and its use in AFMS military treatment facilities in determining/forecasting workload.

<div align="center">Relative Value Unit (RVU)</div>

RVUs are an integral part of the operation of outpatient services in the AFMS. RVUs drive the allocation of funds in the AFMS down to the level of the MTF. Understanding the RVU is essential to any discussion about the operation of the MHS and associated health service supply and demand issues. The current use of "supply" (FTE's/ staffing) to forecast workload will be highlighted in order to identify a supply-demand mismatch. The mismatch forms the basis of an alternate and more accurate method of forecasting MTF workload within the AFMS.

A RVU is a standard unit of measure that is applied to outpatient visits and ambulatory procedures (provider types 1 & 2). The RVU is weighted for intensity of care based on Current Procedural Terminology (CPT) and Evaluation and Management (E&M) codes. CPT codes are published by the American Medical Association and provide a uniform language that describes the medical, surgical and diagnostic service. Modifiers are two digit codes appended to CPT codes that describe the amount of work or level of service performed. Modifiers are also used to identify the degree of diagnostic expertise a healthcare provider uses when treating a patient (Lyons, 2000). The E&M code guidelines are published by Centers for Medicare & Medicaid Services (CMS). An E&M code describes the patient's problem and the skill, effort, time, responsibility and medical knowledge required for the prevention, diagnosis or treatment

of illness or injury (Lyons, 2000). All CPT codes have a corresponding RVU based on the intensity of the visit. As the level of service increases, so does the RVU. A provider's fee is calculated by multiplying a scheduled per unit provider rate by the RVU. Within an MTF, the coding accuracy, documentation and completion of encounters is vital to ensuring the MTF receives funding for the medical care provided. Clearly, uncoded or incomplete documentation of a patient visit directly affects funding for the MTF.

<div align="center">Appropriation</div>

A thorough understanding of the allocation of funds that an MTF ultimately receives each fiscal year begins with the annual budget submission by the President of the United States. An appropriation is a type of budget authority that makes obligations and gives an agency the authority to make subsequent payments from the Treasury. Article I, Section 9, Clause 7, of the Constitution of the United States states that "No money shall be drawn from the Treasury, but in Consequence of an Appropriation made by Law" (Streeter, 2006). Clause 7 is an important constitutional limitation on the power of the President.

The Constitution creates the balance of power between the Executive branch and Congress. Although the President is the Commander in Chief, the power of appropriating money clearly lies with Congress and requires the approval of Congress. In response to the president's budget submission, Congress is required, through the Congressional Budget Act, to submit a budget resolution. The budget resolution becomes a starting point for the House and Senate as they consider various budget bills and appropriations (Streeter, 2006).

The appropriation process begins in the House and Senate appropriation

committees (these committees control 40% of federal spending) and flows through a

series of committee and subcommittee hearings (Conner, 2007). The results of these

hearings produce a House and Senate Report. Interestingly enough, even though both

the House and Senate vote on the budget bills and appropriations, only the Senate

subcommittee has jurisdiction over military activities related to basic housing

allowances, the Defense Health Program (DHP), military facilities, sustainment, and

restoration and modernization. As soon as the House and Senate agree on the text of

the bill it is sent to the President. The President then has 10 days to sign or veto the

bill.

Once the Department of Defense appropriations are approved, the Office of

Management and Budget (OMB) apportions (quarterly distributions) the appropriations

to the Office of the Under Secretary of Defense (OUSD) Comptroller. The

apportionment then flows to the Assistant Secretary of Defense for Health Affairs

(ASD/HA) who distributes these funds to service specific Surgeons General and the

Managed Care Support Contractor (MCSC). Finally, the Surgeon General of the Air

Force, in coordination with the Major Command (MAJCOM) representatives distributes

the funds to Air Force Medical Centers, hospitals and clinics.

Supply-Demand Mismatch

Due to rising healthcare costs, the Air Force Medical Service (AFMS) has closed

medical centers and transferred inpatient care to sister military medical facilities or the

managed care network. A contributing factor to rising healthcare costs is the

prospective payment system processes under which the AFMS currently operates.

As identified under the PPS/RVU subsection, MTFs use a retrospective

aggregate average RVU rate and forecasted supply (FTEs/staffing) estimates to

determine the workload/utilization of outpatient medical services that can be produced for their eligible beneficiary population. These methodologies have created a supply-demand mismatch. Providing medical resources based on "supply" (FTEs/staffing) verse the demand of eligible beneficiaries will consistently result in scenarios where there is too little or too much "supply" to accommodate the demand for medical care of beneficiaries. Both scenarios result in an overall increase in the cost of providing medical care. When patient demand for medical services is not at a level that fully utilizes the supply or capacity available, the resources become part of the waste in the medical system and are absorbed through the total cost of providing care. When demand exceeds supply, the MTF assumes additional costs through an elaborate set of administrative processes that result in the patient entering the private sector/purchased care system to receive medical care.

Statement of the Problem

An accurate forecasting method is essential for the successful operation of a military treatment facility under a prospective payment system. It is imperative because the chosen forecasting methodology must be able to truly determine the MTFs workload relative to the demand of its beneficiaries. As described above, the MTF's current method of forecasting workload is flawed from a supply-demand perspective. As a result of the supply-demand planning dynamic, the likelihood of resources being unused or misused becomes less a question of 'if' and more a question of how much and at what cost?

Moreover, the utilization of a forecasting methodology that is unable to accurately predict demand results in the consumption of additional MTF resources. These

additional resources are consumed through a system of checks and balances that attempt to keep TRICARE prime beneficiaries in the direct care system. Prime beneficiaries remain in the direct care system through prospective review and right of first refusal (ROFR) processes as performed by the referral management center and utilization review teams. Additional resources are also consumed when the attempt to keep the TRICARE prime beneficiary in the direct care system fails. In these instances, the MTF is unable to offer a medical appointment to its prime beneficiary within the access to care standards or the scope of care is beyond the MTF's capability. When this occurs the beneficiary is referred to the private sector for medical care. Costs are incurred through the employment of managed care support contractors who administer a benefit plan that allows an enrolled MTF beneficiary to receive medical care in the private sector.

MTF enrollees can obtain medical care within the military's direct care system as well as the purchased care system. The processes utilized to provide access to these systems financially burden the MTF. Forecasting problems leading to inefficient use of supply or capacity contributes to the process problem and cost for MHS beneficiaries.

<div align="center">Direct Care Options</div>

In the event an MTF is unable to meet the medical demands of its enrolled population, resources are allocated to processes designed to keep the enrollee in the direct care system. One option for an MTF is to establish a workload sharing agreement with a local facility. In areas of the country such as the National Capital Region (NCA) where multiple MTFs are located within the minimum time and travel distance for an appointment, MTFs agree to exchange beneficiary workload based on the potential surplus in supply (FTEs) to prevent enrollees from having to utilize

purchased care (private sector) visits. For example, suppose that during the business planning process an Air Force MTF identifies a 20% surplus in supply of optometry visits for a particular fiscal year. In most instances, it is too late in the planning cycle for an MTF to divert incoming personnel (FTEs) to an alternate MTF. In lieu of having these resources go unused, the Air Force MTF agrees to accept workload from an adjacent naval hospital that is faced with the scenario of not having a sufficient supply of visits based on the same product line (optometry). Collaboration among MTFs in the same geographical location can result in significant savings by diverting medical care away from the private sector.

Private Sector Care

When demand exceeds the supply (FTEs/staffing) of medical services available at a MTF and alternatives are not available, the enrollee is referred to the private sector to receive medical care. At this point, a referral for an episode of care has already been sent to the hospital's referral management center (RMC) by the primary care provider. The RMC verifies that there are no MTF appointments available within the required TRICARE access to care standards. Once verified, the RMC sends the referral to the Managed Care Support Contractor (MCSC). There are three MCSCs who cover the 50 U.S. states and assist with administering the TRICARE benefit plan within the MTF. When a MCSC receives a routine referral for private sector care, the MCSC coordinates the enrollee's appointment with a network of providers who have previously agreed to provide medical care to military beneficiaries, commonly referred to as purchased care facilities. Once the appointment is confirmed, the MCSC sends the enrollee a letter stating the date, time and location of the private sector appointment.

Purpose Statement

The cumulative effect of the MTF's current business planning process and workload forecasts is a system that is fundamentally flawed. The flaw is the supply-demand mismatch that creates inefficiency and waste within the MTF. Flawed forecasting affects the AFMS and on a larger scale, the MHS. The result is increased costs to provide medical care to enrolled beneficiaries via a sophisticated web of review, authorization processes and referrals. Moreover, additional costs are due to the time, manpower and infrastructure required to keep as much patient care as possible within the direct care system, as well as to coordinate care for the beneficiary within the purchased care system.

This research paper proposes that the solution to the dilemma of over or under estimating workload for medical services associated with enrolled beneficiaries starts with a fundamental change in forecasting methodology; using demand instead of supply (FTEs/staffing). To that end, the purpose of this paper is to determine if the demographic variables of age, gender and beneficiary category have value in forecasting workload as measured in relative value units (RVUs). A strong association between workload and demographic variables establish the foundation for the future use of these variables in the development of a predictive model for determining the workload produced at Air Force Medical Service military treatment facilities.

In order to establish the association between workload and demographic variables of interest, a retrospective analysis of outpatient workload (primary & specialty care) is accomplished based on three geographically diverse U.S. military treatment facilities (Nellis AFB, Langley AFB and Travis AFB). The Mike O'Callaghan Federal Hospital (MOFH) at Nellis AFB is a 114 bed facility with a full array of outpatient

(primary care and specialty care) clinics. The facility provides service to 22K active duty members in addition to 40K retirees and operates in conjunction with the Veteran's Administration (VA) through a workload sharing agreement (Nellis, nd.). The 1st Medical Group at Langley AFB is home to a robust outpatient facility that recently closed its 40 bed inpatient unit. It serves a local patient population of approximately 60K active-duty members, their families and retirees. In FY06 they provided outpatient services for over 210K outpatient visits (Langley, 2004). The David Grant Medical Center (DGMC) at Travis AFB is the Air Force's largest medical center on the west coast. It provides a full spectrum of care to 82K eligible beneficiaries and 400K veterans and also utilizes a VA workload sharing agreement. DGMC averages 1287 outpatient visits and 1,484 lab tests a day (David Grant, 2007).

Theoretical Framework

The theoretical framework for this research study is derived from Andersen's Behavioral Model (Andersen, 1968; Andersen & Newman, 1973). The Behavioral Model was developed for the explanatory or predictive use of formal personal health services (Andersen, 1995). The Model dates back to the 1960s, when Andersen suggested that the healthcare services people use are a function of predisposing, enabling, and need characteristics.

Andersen's (2005) predisposing characteristics include demographic variables such as age and gender. Additional predisposing variables include social structure and health beliefs. Social structure is traditionally measured by an individual's education, occupation and ethnicity, while health beliefs refer to the attitudes, values and knowledge that influence the individual who is seeking the health service. The model

used for this research includes the predisposing demographic variables of age, gender and beneficiary category and seeks to identify a difference in mean values with the criterion variable of workload, measured in relative value units (see Figure 1).
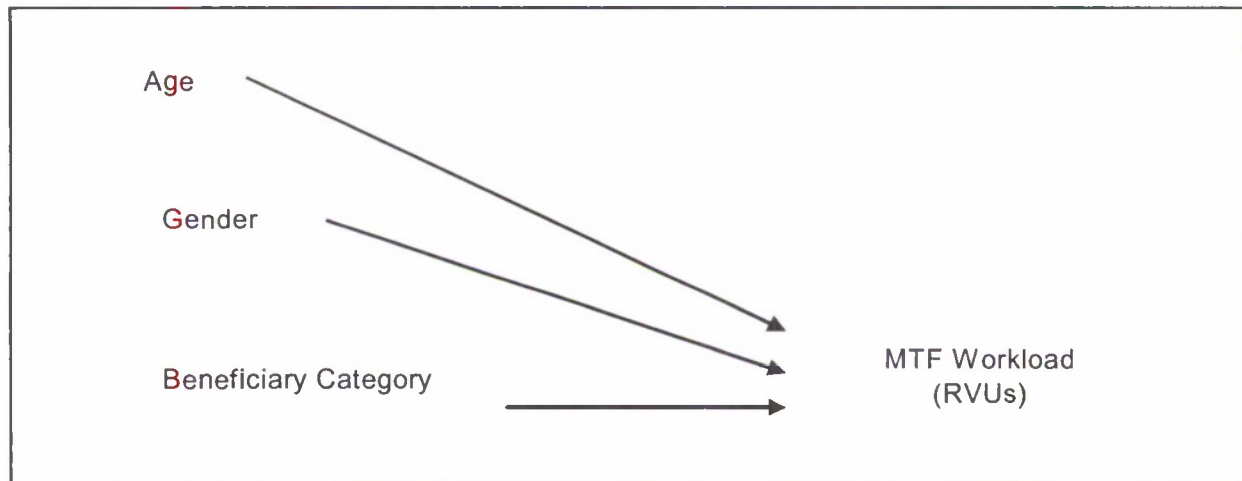

Figure 1. Framework illustrating the effect of demographic variables on a MTFs workload (adapted from Andersen's 1995 model of predisposing characteristics for use of health services).

Literature Review

Research conducted in the private sector, Veterans Administration (VA) and the Military Health System illustrates the association among demographic variables and utilization of medical services (workload) in the outpatient setting. Existing research supports the use of age groups, gender, and beneficiary categories as independent variables used in identifying a difference with the workload produced in the primary and specialty care setting.

Age Groups and Workload

In determining the effects of age groups on healthcare expenditures, it is important to recognize that over time, age specific utilization patterns change among cohorts. Several studies support the disproportionate increase in costs among the very young and the very old as compared to those in the middle age groups (Cutler & Meara,

1999; Mendelson, & Schwartz 1993; Meara et al., 2004; Meerding, et al, 1998; Naessens et al. 2005; Polder et al., 2002; Reinhardt, 2003; Schneider & Gurainik, 1990; Seshamani & Gray, 2002). Polder (2002) identified costs that rise exponentially from 55 onwards and reach their highest levels at age 85 and older. Additional data supports the use of age categories in determining utilization and medical care (Holthus, 1993; Patterson et al., 2006; Reid et al., 2001; Sales et al., 2003; Yu-Isenberg et al., 2005). Yu-Isenberg et al. (2005) utilized age categories to determine that healthcare expenditures were two to three times higher in patients with COPD in the 55-64 year old category. Likewise, Sales et al. (2003) was successful in utilizing five age groups (18-34, 35-54, 55-64, and 65-74 and greater than 75) to compare the mean predictive cost among three risk assessment instruments (Adjusted Clinical Groups (ACGs), Diagnostic Cost Groups (DCGs) and Rx-Risk-V). The outcome variable in Sales et al. (2003) study is total costs of Veterans Health Administration (VHA) care measured in relative value units (RVUs). Sales' et al. (2003) research also supports the use of RVUs as an accurate approach to costing (Ashby, 1993; Schwartz et al., 1995).

<center>Gender and Workload</center>

Gender is used in numerous studies to establish a difference with workload relative to the intensity of medical care an individual receives (Diehr et al., 1999; Frayne et al., 2007; Holthus, 1993; Levy et al., 2003; Naessens et al., 2005; Polder, 2002). In the military, private sector and VHA, women use outpatient healthcare services more than men (Carney et al., 2003; Frayne et al., 2007; Schappert & Burt, 2006; Kaur, 2007). This is due primarily to gender-specific care such as gynecological procedures, mammography and obstetrical care (Yano et al., 2003). The Centers for Disease Control and Prevention report that regardless of race, the overall rate of ambulatory

care use among women with non-pregnancy-related diagnoses was 33% higher than that for men (Brett & Burt, 2001). Furthermore, the rate of visits by women ages 15 to 44 years was approximately 56% greater than the rate for men in this age group (Brett & Burt, 2001). Diehr et al. (1999) report similar utilization of medical care services among males and females, but only until puberty. At puberty, Diehr et al. (1999) state the increase in utilization of medical services by women is due to childbearing. Levy et al. (2003) concluded that active duty females generate an average of 1.44 RVUs of workload compared to .74 by male. The study encompassed data from 1.1 million outpatient visits from several Navy clinics. Moreover, Turner et al. (2004) and Frayne et al. (1999) identified an additional variable that leads to an increase in frequency and intensity of outpatient care by women. These research studies found that women on active duty experience an increased likelihood of having sexual trauma. The increased likelihood of sexual trauma has persistent effects on health and healthcare use that drive greater utilization of medical services by women.

<div align="center">Beneficiary Category and Workload</div>

The utilization of military beneficiaries enrolled at the MTF is defined in the United States Code: Title X. Title X classifies the priority of access for medical care by beneficiary category type (U.S. House, 2006). Active duty members are those beneficiaries with the highest priority for MTF care and are followed by their active duty dependents. Additional beneficiary categories include retirees and their dependents, who receive medical care at the MTF on a space available basis (Future of Military Healthcare, 2007). Retirees over age 65 are last on the priority ladder in terms access to medical care in MTFs. The priority and use of beneficiary categories are useful in explaining workload/utilization patterns produced at military treatment facilities

(Constantian, 1998; Hartzell & Peterson, 2004; Holthus, 1993; Levy, 2003). Therefore, an established association between workload and beneficiary category enables administrators to more accurately define the resources required to provide care for the enrolled population at an MTF.

Methods and Procedures

The method used to determine if a difference exists between workload and demographic variables is univariate analysis. The data for the analysis is drawn from the Military Health System Management and Analysis Reporting Tool (M2) for fiscal year 2006. The procedures identified in the data source and methods subsections specify the origin of the research data in addition to the categorization of each variable into dichotomous categories. The methods and procedures lead to the hypotheses of the research that is additionally supported by reviews from the literature.

<u>Data Source</u>

The primary source of data used to support the objective of this study is drawn from the Military Health System Management and Analysis Reporting Tool (M2) for fiscal year 2006. Patient names and any identifying information are not used.

The data utilized is derived from three MTFs: Langley AFB (Virginia), Nellis AFB (Nevada) and Travis AFB (California). The categorical variables drawn from M2 consist of: age, gender, beneficiary category, simple RVU and MTF Defense Medical Information System (DMIS) Identifier (ID). These variables are based on inputs from the Armed Forces Health Longitudinal Technology Application (AHLTA), the military's electronic health record, and the Defense Enrollment Eligibility Reporting System (DEERS). DEERS serves as a primary interface to AHLTA for enrollment and demographic information.

Methods

The analyses are conducted using univariate analysis of variance to assess the difference in workload in relation to the predictor variables of age, gender and beneficiary category. This method of analysis studies the distribution of cases of one variable without relating it to other independent variables (Vogt, 1999). Univariate analysis is used in lieu of a regression analysis due to the aggregation/averaging of data as it is pulled from the Military Health System Management and Analysis Reporting Tool (M2). Each data point represents workload for a group of people with a particular set of descriptive characteristics.

There were approximately 2.1 million eligible beneficiaries located at Langley AFB, Nellis AFB, and Travis AFB in FY06. During FY06, the 2.1 million eligible beneficiaries that include active duty members, active duty dependents, retirees and retiree dependents received 715,463 relative value units of care. Of these eligible beneficiaries 19% or 406,755 are TRICARE for Life (TFL) beneficiaries. TFL is a comprehensive healthcare coverage benefit for military retirees, spouses, and survivors eligible for Medicare due to age (65 and older) or disability (Future of Military Healthcare, 2007). These beneficiaries are eligible to receive healthcare related services at an MTF on a space available basis.

Of the predictor variables, age data was grouped into seven categories based on similar age group delineations used in previous studies (Holthus, 1993; Reid et al., 2001; Sales et al., 2003; Yu-Isenberg et al., 2005). Age groups included: 0-4, 5-18, 19-24, 25-34, 35-44, 45-64 and 65 and over. By grouping observed ages, the age data could be recorded dichotomously. Code "1" was used for observations within the delineated age group and code "0" for observations from other age groups.

In addition to age, four beneficiary categories were utilized for analytical purposes and are reflective of Title X beneficiary categories (U.S. House, 2006). The categories are: Active Duty, Active Duty Dependent, Retiree and Retiree Dependent. Active duty includes all persons on active duty including active National Guard and active Reservist members. Active duty dependents include all spouses and dependent children of active duty members. The Retiree category includes all persons collecting retirement benefits who previously served on active duty, including National Guard and Reservist members. Retiree dependents include all spouses and dependent children of retired members. All beneficiary category data was recorded dichotomously: "1" if the observation belonged in the beneficiary category and "0" if the observation did not belong in the beneficiary category.

Gender was also collected for all study observations and recorded dichotomously: males "1" and females "0." In total, the seven age categories, two gender groups and four beneficiary categories resulted in 1,529 data observations ($n =$ 1,529).

Each point within the data consists of an observation that represents a RVU value for a particular group for the FY 2006 time period. An example of a data point is a male active duty beneficiary in the 19-24 age group. These data observations reflect the total number of unique combinations of independent variables possible (1,536), minus the number of variable combinations that are not realistic, such as: "Nellis, female, age 2, active duty".

The calculation of the mean RVU per beneficiary is a two part process. As described above, the RVU value is representative of a particular group. The sum of

RVUs for a data point is divided by the number of eligible beneficiaries within this same grouping. The number of eligible beneficiaries includes those beneficiaries who received care at the MTF and those who did not receive care at the MTF. Those beneficiaries who received care at the MTF were assigned an RVU value for their visit. However, the eligible beneficiaries who did not receive care were assigned a zero. Therefore, the sum of the RVUs for a data point divided by the total eligible beneficiaries within a specified grouping contains a large number of zeros that are reflective of the eligible beneficiaries who did not receive care at the MTF. This method of determining the mean RVU per beneficiary value results in a lower mean RVU per beneficiary value, however, it is consistent between groups within the study. Therefore, the reader should keep a perspective when comparing these mean RVU per beneficiary values with previously studied research. For the purposes of comparison, the mean RVU rate associated with a primary care visit with a diagnosis of a common cold (diagnosis code 460) is approximately 1.04. The most common Evaluation and Management (E&M) code for the same diagnosis is 99213 with an associated RVU value of .92.

The statistical method used to compare the mean differences between independent variable groups and the dependent variable is univariate analysis. The critical probability value for this study is established at $\alpha = .01$.

Hypotheses

This study has six primary hypotheses based largely on previous research findings:

1) A positive difference exists between workload and age categories.

1a) The very old (65 years and older) are more strongly associated with mean workload than any other age group under study.

Use of health services has been shown to increase with age (Meerding et al, 1998; Naessens et al., 2005; Polder et al., 2002; Reinhardt, 2003; Schneider & Gurainik, 1990; Meara et. al, 2004). Meara et al. (2004) also found that spending for physician and clinical services from 1996 to 2000 increased 5.1% per year for those aged 65 and older compared to 2.6% for the nonelderly.

2) A positive difference exists between workload and gender.

2a) The positive difference that exists between workload and gender is greater in females than males

Gender specific medical care and obstetrical care as women reach the age of child-bearing are strongly related to the increase use of medical services as compared to men (Brett & Burt, 2001; Diehr, 1999; Yano et al., 2003). The research performed by Brett and Burt (2001) also identified a 33% increase in ambulatory care among women with non-pregnancy related diagnoses as reported by the CDC.

3) A positive difference exists between workload and military beneficiary categories.

3a) Active duty beneficiaries generate a greater mean RVU per beneficiary value as compared to that of the Retiree beneficiary category.

The research supporting the outcome of hypotheses 3 and 3a is Title X of the United States Code. This law prioritizes the access to care within a MTF. Active Duty members have the highest priority for medical access to care, while retiree eligible beneficiaries receive medical care at the MTF on a space available basis (Future of Military Healthcare, 2007).

Results

A total of 1,529 data points, from FY06 data, that represent an aggregate/average measure of all beneficiaries that meet specific age, gender and beneficiary category requirements from three USAF MTFs were analyzed. Observations of annual workload (RVUs/beneficiary) were examined for a difference with age, gender and beneficiary category using the Statistical Program for the Social Sciences (SPSS) version 13. Descriptive statistics for the variables are listed in Table 1.

The mean annual RVU per eligible beneficiary for the study was .47 RVUs with 88% of all data observations falling between 0 and 1.05. The mean RVUs for age ranged from a low of .20 RVUs for 5-18 year olds to a high of .66 for those beneficiaries aged 45-64 years old. The mean RVUs for gender varied from .43 for males to .52 for females. Finally, the mean RVUs for beneficiary category ranged from .28 RVUs for Retiree Dependents to 1.13 RVUs for Active Duty members. Although all observations from the three military treatment facilities were used to determine the mean RVU/beneficiary, many of the standard deviations are larger than the means; particularly for the older age groups, gender and beneficiary category. Standard deviations that are greater than the means indicate the presence of variation and outliers in the existing data set.

Table 1

Mean RVU/beneficiary by Independent variable for 1,529 data points of workload for eligible beneficiaries located within the catchment area of three Air Force Military Treatment Facilitles (MTFs) durlng fiscal year 2006.

Variables	Mean RVU/Beneficiary	SD	n	%
RVU/Beneficiary/Year	0.47	0.58	1,529	100
Age				
0-4	0.39	0.32	60	3.92
5-18	0.20	0.21	177	11.58
19-24	0.53	0.49	122	7.98
25-34	0.50	0.38	222	14.52
35-44	0.51	0.42	234	15.30
45-64	0.66	0.81	448	29.30
65-99	0.28	0.49	266	17.40
				100.00
Gender				
Male	0.43	0.61	747	48.86
Female	0.52	0.54	782	51.14
				100.00
Beneficiary Category				
Active Duty	1.13	0.72	262	17.14
AD Dependent	0.49	0.56	431	28.19
Retiree	0.28	0.28	368	24.07
Retiree Dependent	0.47	0.58	468	30.61
				100.00

Figures 2 and 3 represent the mean RVUs demanded as a function of age category, gender and beneficiary category. They are provided to better illustrate the difference among the mean level of workload produced as a function of the independent variable categories and groups used during the research.

More specifically, figures 2 and 3 illustrate the significant difference in the mean RVU/beneficiary (workload) produced by male and female active duty members in relation to all other respective age groups and beneficiary categories. The one instance where the active duty male RVU/beneficiary rate for the 65-99 age group is lower than that of the corresponding active duty dependent group is discounted due to a lack of a representative number of observations for the aforementioned group (6 data observations collected). These results may be a function of the priority of care access

within the MTF (Title X of the U.S. Code) and the use of all eligible beneficiaries for the

denominator when calculating the mean RVU/beneficiary rate.

From an alternate perspective, the workload produced by the retiree population is

less than that of the active duty and active duty dependent population. Typically, it

would be expected that the active duty population is healthier and would therefore

generate a less intense RVU visit. Additionally, it is expected that as people age the

incidence of chronic illnesses and disease increases resulting in a more intense visit.

Further analysis of the retiree population illustrates that the male 19-24 and 25-34

retiree age group and the female 19-24 retiree age group generated a larger mean

RVU/beneficiary rate than the respective active duty dependent groups. A potential

justification for the intensity among these groups relates to injuries obtained during

deployment in the War on Terror in Iraq and Afghanistan. However, the means to justify

this assumption is unavailable based on the extraction method of the current data set.

Figure 2. Line graph illustrating the mean RVU per beneficary consumed by males according to age category (x axis) and beneficiary category (colored lines) within the catchment areas of Nellis AFB, Langley AFB and Travis AFB medical treatment facilities.
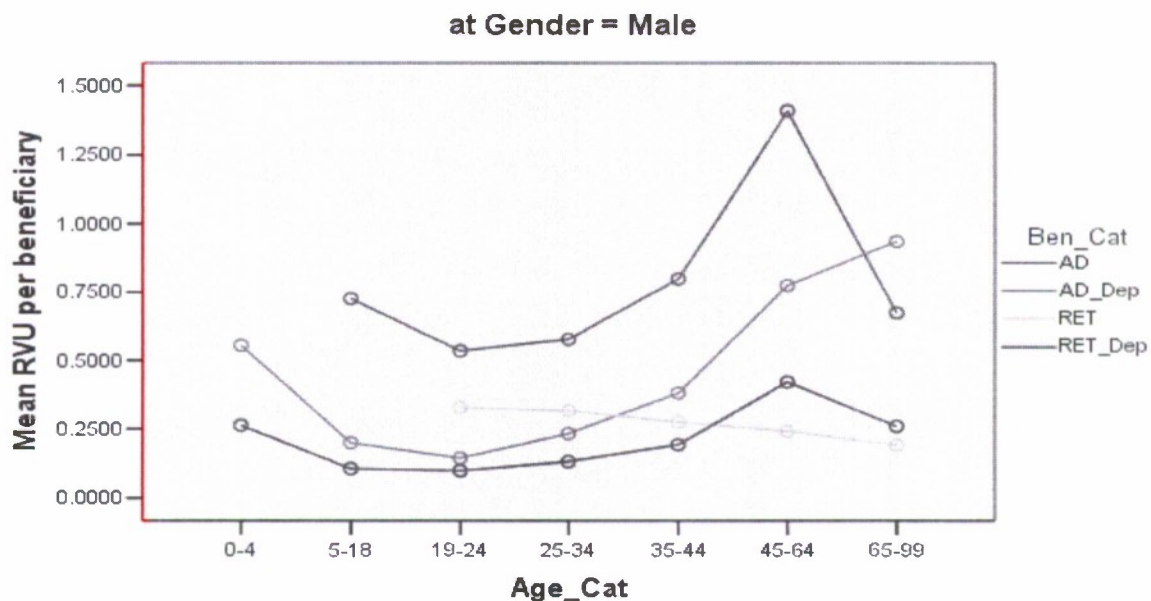
at Gender = Female

Figure 3. Line graph illustrating the mean RVU per beneficary consumed by females according to age category (x axis) and beneficiary category (colored lines) within the catchment areas of Nellis AFB, Langley AFB and Travis AFB medical treatment facilities.
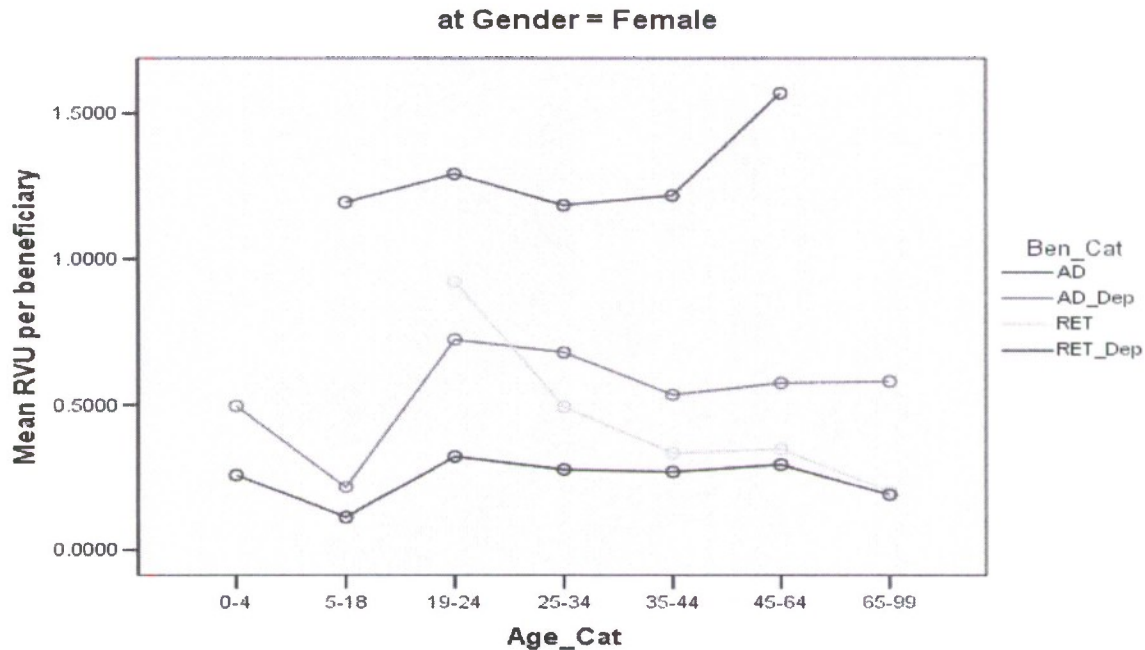
The descriptive statistics in Table 2 provide a more tangible representation of the data. Table 2 provides the mean RVU per encounter by independent variable. In addition, the table further provides the percentage of workload created as a function of each independent variable. Note the difference between the volume of eligible beneficiaries and the volume of outpatient MTF workload consumed by eligible beneficiaries. Though active duty members only comprise 15.16% of all eligible beneficiaries, they consume 33.60% of all outpatient MTF workload. In contrast, the retired beneficiary category comprises 28.52% of all eligible beneficiaries, but only consumes 18.41% of outpatient care.

Table 2
Mean RVU per Encounter per Independent variable for fiscal year 2006 for three Air Force Military Treatment Facilities (MTFs).

Variables	Mean RVU / Encounter	# RVUs	# Beneficiaries	% Beneficiaries	% MTF Workload
Encounters/Beneficiary/Year	1.01	715,463	2,050,612	100	100
Age					
0-4	0.93	54,568	108,479	5.29	7.63
5-18	0.91	55,798	340,876	16.62	7.80
19-24	1.06	103,962	202,510	9.90	14.53
25-34	1.05	133,560	204,149	9.96	18.67
35-44	1.01	113,226	216,872	10.57	15.83
45-64	1.01	176,256	570,971	27.83	24.63
65-99	1.01	78,091	406,755	19.83	10.91
				100	100
Gender					
Male	1.02	349,907	1,093,574	53.33	48.91
Female	1.00	365,556	957,038	46.67	51.09
				100	100
Beneficiary Category					
Active Duty	1.06	240,379	310,925	15.16	33.60
AD Dependent	0.97	197,050	471,325	22.98	27.54
Retiree	1.02	131,748	584,721	28.52	18.41
Ret Dependent	0.98	146,286	683,641	33.34	20.45
				100	100

The bar charts in figures 5, 6 and 7 illustrate the percent of eligible beneficiaries by independent variable and the percent of MTF workload created by each category. Figure 5 illustrates that the second largest age group eligible for care within the MTF are those beneficiaries in the 65-99 age group. This age group represents 20% of the beneficiary population. However, of the beneficiaries in the 65-99 age group, those retirees that are considered to be the very old (85 years an older) represent only 4% or 24,137 beneficiaries.

Comparison of Beneficiary Volume to MTF Workload

■ % Beneficiary Volume   ☰ % MTF Workload

Figure 5. Bar graph illustrating volume of eligible beneficiaries by age group compared to volume of MTF workload

Comparison of Beneficiary Volume to MTF Workload

■ % Beneficiary Volume   ☰ % MTF Workload

Figure 6. Bar graph illustrating volume of eligible beneficiaries by gender compared to volume of MTF workload

In figure 7, note the difference in the volume of beneficiaries and the percentage of workload generated by the beneficiaries for the active duty and retiree beneficiary groups. Intuitively, the AD population is healthier and would use more services with a lower workload. Also, one would expect that due to the development of chronic ailments and associated illnesses that the retiree population would demonstrate a

workload that is double that of the eligible population. However, this is not the case. The percentage of workload produced by active duty members is more than double in relation to its volume and the workload produced by the retiree population is close to half of the volume of eligible beneficiaries. A discussion regarding this reversal in workload compared to enrollment is supported in hypotheses discussion 3 and 3a.

Figure 7. Bar graph illustrating volume of eligible beneficiaries by beneficiary category compared to volume of MTF workload
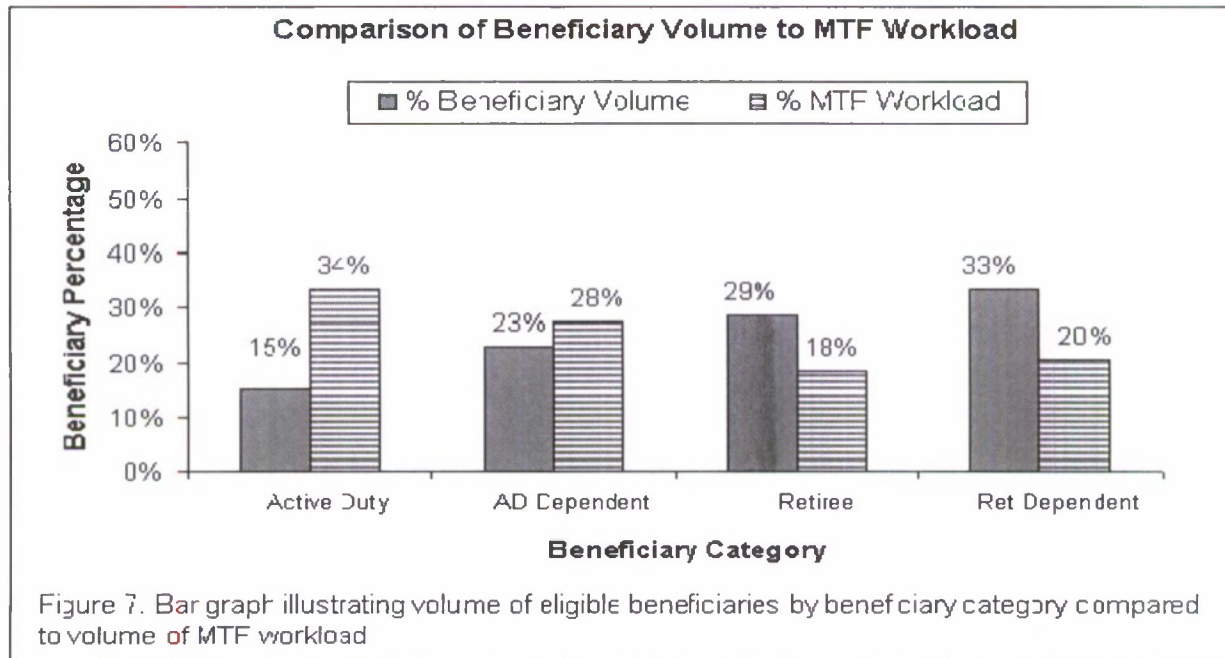
Table 3 contains the results of the analysis of variance. The results include the degrees of freedom (df), F values and significance levels. There are multiple significant effects. The main difference between the dependent variable (RVUs/beneficiary) and age category yielded $F(6, 1480) = 11.17$, $p < .000$. Likewise, significant results were realized between workload and gender $F(1, 1480) = 30.65$, $p < .000$ as well as workload and beneficiary category $F(3, 1480) = 51.85$, $p < .000$. Significant results are also recognized for the interaction effects between age category and gender with workload $F(6,1480) = 8.61$, $p < .000$, age category and beneficiary category with workload $F(15, 1480) = 6.05$, $p < .000$ and gender and beneficiary category with workload $F(3, 1480) =$

6.19, p < .000. The R Squared associated with the corrected model (note b) is the

amount of dependent variable variance that is accounted for by the corrected model. In

this analysis, the three main effects account for 42% of the variance in the scores. The

R squared for the particular sample will always be larger than the R squared for the

population from which the sample was taken. The R squared result takes advantage of

the variation in the sample that will not be present in the population as a whole. The

adjusted R squared is 41%. This figure is an estimation of the predictability of the

model in the population as a whole. In this case, the model is expected to account for

41% of the variance in the dependent variable in the general population.

Table 3. Analysis of Variance Tests of Between-Subjects Effects			
Tests of Between-Subjects Effects			
Dependent Variable: RVUs/Benefiary			
Source	df	F	Sig.
Corrected Model	48	22.63	.000
Intercept	1	656.52	.000
Age_Cat	6	11.17	.000
Gender	1	30.65	.000
Ben_Cat	3	51.85	.000
Age_Cat * Gender	6	8.61	.000
Age_Cat * Ben_Cat	15	6.05	.000
Gender * Ben_Cat	3	6.19	.000
Error	1480	-	-
Total	1529	-	-
Corrected Total	1528	-	-
a. Computed using alpha = .01			
b. Partial Eta Squared / R Squared = .423 (Adjusted R Squared = .405)			

The *F* ratios depict the strengths of the differences that are suggested by the

association between the dependent and independent variables. The alpha for this

analysis was p < .01, but the difference between the variables remains significant at the

α = .001 level. Since the mean comparisons are significant for all three independent

variables, it is probable that outpatient workload can reliably explain 42% of the

variance by using age, gender and beneficiary category at p < .001. These results

could be expected less than one time out of 1000 due to chance alone.

Discussion

The rising cost of providing medical care in the private sector and the MHS in

conjunction with the BRAC downsizing are trends that led to the research on outpatient

workload (Bodenheimer, 2005b; Bodenheimer, 2005c; Borger et al., 2006; Catlin et al.,

2006; Future of Military Healthcare, 2007; The Henry J. Kaiser, 2006). A strong

difference between workload and demographic variables (age, gender, beneficiary

category) provides the foundation for the future use of demographics to determine MTF

workload. The results of this research support the use of age, gender and beneficiary

category to more accurately forecast resource requirements. These results can be

applied at the executive, clinic or specialty level of care within an MTF to assist in the

building or development of a predictive model that will project consumer demands. The

data from three Air Force healthcare facilities in diverse geographic locations were used

to provide results that would be applicable to any region of the country where similar

competitive outpatient care markets exist.

<div align="center">Hypotheses: 1 & 1a</div>

The research study demonstrates that a positive difference between workload

and the demographic variable of age groups and workload does exist (F(6, 1480) =

11.17, p < .000). Therefore, hypotheses 1 and 1a are accepted. The research supports

the disproportionate utilization of medical services among the very old in comparison to

those in the middle age groups (Bodenheimer, 2005; Cutler & Meara, 1999; Meara et

al., 2004; Meerding et al., 1998; Mendelson & Schwartz, 1993; Naessens et al., 2005;

Polder et al., 2002; Schneider & Gurainik, 1990). The workload represented by the age

category considered to be the very old (65-99) had a mean RVU/beneficiary rate of .28.

However, the mean workload for the age groups between 19 -64 was .58

RVUs/beneficiary. The workload represented by the 19-64 year age group is 52%

greater than that of the 65-99 age group.

The variation in the results may be explained by Title X of the U.S. Code. This

law provides eligible TFL beneficiaries with the lowest priority of medical care access

within the MTF. The limited access to MTF medical care by the TFL patients

additionally decreases the overall mean RVU/beneficiary rate due to the methodology

utilized in calculating the mean RVU/beneficiary rate. Each eligible beneficiary that is

not able to obtain access to the direct care system is assigned a zero RVU rate.

Therefore, the number of zeros used in the calculation of the mean RVU/beneficiary

rate becomes a function of the eligible population. The result is a lower mean RVU per

eligible beneficiary.

Perhaps additional reasons for the low RVU value are the availability of Medicare

and VA services for this age group. The data captured from M2 does not contain all the

medical care received from systems outside of the MHS. Additionally, because

beneficiaries over age 65 have access to medical services on a space available basis,

they may use the MTF for only special and low intensity instances.

<u>Hypotheses: 2 & 2a</u>

The research also identified a strong difference between workload and gender

$(F(1, 1480) = 30.646, p < .000)$. The overall mean RVU/beneficiary for females was .52

and males .43. These results also indicate the acceptance of the hypotheses, workload

and gender are related and the mean RVU/beneficiary for females is greater than

males. The results demonstrate that female utilization of medical services was 17%

higher than that of males. This result supports previous research related to the intensity of healthcare utilization by women (Carney et al., 2003; Frayne et al., 2007; Kaur, 2007; Schappert & Burt, 2006). The analysis of the intensity of medical services between active duty males and females yielded an RVU/beneficiary rate of .94 for males and an RVU/beneficiary rate of 1.34 for females. These results indicate that on average active duty females utilize 30% more medical services than do males. These results are similar to those found by Levy (2003) during the analysis of the intensity of workload produced by active duty males and females throughout several Navy clinics. Levy's (2003) work demonstrated that active duty males yielded .74 RVUs verses 1.44 RVUs for women. The intensity of workload increase by women throughout the Navy clinics totaled 48%. In addition, Brett & Burt (2001) reported that the rate of visits by women ages 15 to 44 years was approximately 56% greater than the rate of men. Replicating this analysis, the FY06 data set from the three Air Force MTFs demonstrated a rate of visits by women that was 12% greater than that of men.

Hypotheses: 3 & 3a

A positive difference was found between workload and military beneficiary categories ($F(3, 1480) = 51.847$, $p < .000$). Active Duty members yielded 1.13 RVUs per beneficiary as compared to .28 RVUs by the Retiree population, resulting in the acceptance of the final two hypotheses (see Table 1). These results support a positive association between workload and military beneficiary categories in addition to demonstrating the higher yield of RVUs per beneficiary by active duty members as compared to the retiree population. As with hypotheses 1 and 1a, the results of hypotheses 3 and 3a are supported and attributable in part to Title X of the U.S Code that establishes the priority/precedent for appointment availability within the MTF.

In effect, Title X limits the availability of appointments within the MTF by TFL eligible beneficiaries. The Retiree beneficiary category consisted of 43% or 254,210 eligible beneficiaries aged 65 years or older (TFL) who are only able to seek medical care within the MTF on a space available basis. These beneficiaries contributed 38% of the total RVUs produced by the Retiree beneficiary category. The remainder of the eligible TFL patient population contributed a zero RVU rate into the mean RVU/beneficiary calculation driving the overall mean RVU/beneficiary rate down to .28. The denominator in the mean RVU/beneficiary calculation consists of the total number of eligible beneficiaries. Therefore, each eligible beneficiary that does not contribute to the MTF workload is given a zero RVU rate in the mean RVU/beneficiary calculation.

In contrast, active duty members who have the highest priority of care in the MTF represent 15% of the beneficiary population (310,925). Active duty also generated 45% more workload than retirees. The retiree beneficiary category as a whole represented 33% of the beneficiary population (584,721) in the current study (see Table 2). The results of providing MTF care under Title X coupled with the use of eligible beneficiary population as a denominator in the mean RVU/beneficiary calculation explains the inverse relationship between volume and workload between active duty and retiree populations.

Conclusion

In this study, 42% of the variance associated with workload production was accounted for using age, gender and beneficiary categories to explain the difference between group means. The research findings indicate that these explanatory factors of workload can provide significant value as part of the future development of a forecasting

model that has the capability to predict outpatient workload if utilized by MTFs within the AFMS. To the extent that the business planning within the Army and Navy are similar, these results are also applicable.

Additional variables are required to improve this comparative model and enhance the explanation of the variance between groups. Variables such as martial status and ethnicity are available to the AFMS and the Military Health System (MHS) through the M2 central data repository. These variables may provide a further explanation for workload variance enabling the development of a more comprehensive analytical model. Although the Military Health System's primary source of data for conducting research is obtained through the use of M2, the reliability of this data is contingent upon accurate input from its users. Due to human error, using M2 as a source of data is a limitation of this workload study as well as future studies of a similar nature.

In conclusion, as the military moves toward revised financing, it is imperative to accurately assess the future demand for product lines. By identifying workload associated with demographic analysis and implementing a similar model, the MHS can further enhance its ability to match available resources with MTF needs and be prepared to meet the changing demands of the military beneficiary.

Recommendations

Future studies on the analysis of workload require the collection of individual patient data. The use of observations with aggregate/averaged data from M2 limited the level of analysis and the practical application of the results. For example, the outpatient data as retrieved from M2 did not enable the researcher to take into effect the workload for mental health services and the differences that occur between males and

females. Moreover, the use of the enrolled beneficiary population of MTFs under study will also provide a more realistic value of an MTF's workload (RVUs/beneficiary) based on demographic category grouping. Utilizing eligible beneficiaries, as was done in the current research, does not allow for an accurate comparison with studies conducted in the VHA or private sector and is complicated by priority of access to care within an MTF.

The use of univariate analysis allows for the creation of a comparative model to analyze the differences in means between groups and assess the statistical relationship between categorical and continuous variables. The use of individual patient data will also enable the creation of a predictive model from which a regression analysis can be performed and the variability of MTF workload can be explained or predicted.

Lastly, the use of age, gender and beneficiary categories are only a small subset of predisposing characteristics of the Anderson (1995) model. Martial status and past illness are additional demographic variables Anderson (1995) discusses as predisposing factors for healthcare utilization. Additional determinants that should be considered in future research studies include Anderson's variables related to social structure, beliefs, family, and community.

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